User Manual

Revision 2.002
English

CAN / Modbus TCP Slave - Converter

(Order Code: HD67515-A1, HD67515-B2)

for Website information:
www.adfweb.com?Product=HD67515

for Price information:
www.adfweb.com?Price=HD67515-A1
www.adfweb.com?Price=HD67515-B2

Benefits and Main Features:

- Very easy to configure
- Low cost
- Rail mountable
- Wide supply input range
- Galvanic isolation
- Industrial temperature range:
  -40°C / 85°C (-40°F / 185°F)

HD67515-A1

HD67515-B2

Similiar Products

Benefit

For other Gateways / Bridges:

CANopen to Modbus

See also the following links:

www.adfweb.com?Product=HD67001	(Modbus RTU Master)
www.adfweb.com?Product=HD67502	(Modbus RTU Slave)
www.adfweb.com?Product=HD67504	(Modbus TCP Server)
www.adfweb.com?Product=HD67505	(Modbus TCP Client)

CAN to Modbus

See also the following links:

www.adfweb.com?Product=HD67011	(Modbus RTU Master)
www.adfweb.com?Product=HD67012	(Modbus RTU Slave)
www.adfweb.com?Product=HD67514	(Modbus TCP Client)

Ethernet to

See also the following links:

www.adfweb.com?Product=HD67503	(CANopen)
www.adfweb.com?Product=HD67513	(CAN)

Do you have an your customer protocol?
See the following links:
www.adfweb.com?Product=HD67003

Do you need to choose a device? do you want help?
Ask it to the following link:
www.adfweb.com?Cmd=helpme

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UPDATED DOCUMENTATION:

Dear customer, we thank you for your attention and we remind you that you need to check that the following document is:

- Updated
- Related to the product you own

To obtain the most recently updated document, note the "document code" that appears at the top right-hand corner of each page of this document.

With this "Document Code" go to web page www.adfweb.com/download/ and search for the corresponding code on the page. Click on the proper "Document Code" and download the updates.

To obtain the updated documentation for the product that you own, note the "Document Code" (Abbreviated written "Doc. Code" on the label on the product) and download the updated from our web site www.adfweb.com/download/

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.002	21/05/2010	Ft	All	Revision
1.003	26/05/2011	Dp	All	Revision
2.000	10/11/2011	Fl	All	Codes changed
2.001	03/09/2012	Fl	All	Revision
2.002	14/01/2013	Nt & Fl	All	Added new chapters

WARNING:

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ADFweb.com is not responsible for any error this manual may contain.

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SECURITY ALERT:

GENERAL INFORMATION

To ensure safe operation, the device must be operated according to the instructions in the manual. When using the device are required for each individual application, legal and safety regulation. The same applies also when using accessories.

INTENDED USE

Machines and systems must be designed so the faulty conditions do not lead to a dangerous situation for the operator (i.e. independent limit switches, mechanical interlocks, etc.).

QUALIFIED PERSONNEL

The device can be used only by qualified personnel, strictly in accordance with the specifications.
Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of this equipment and who have appropriate qualifications for their job.

RESIDUAL RISKS

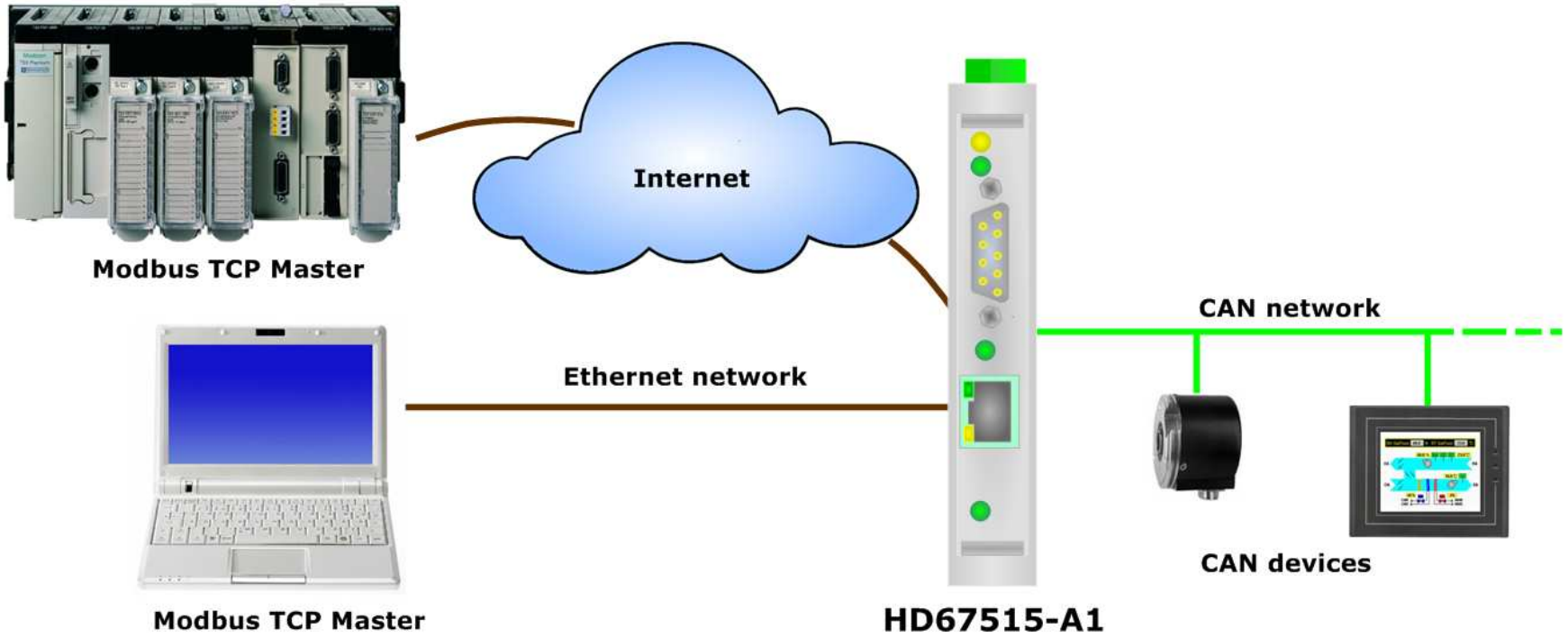
The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

This symbol indicates that non-observance of the safety instructions is danger for people to serious injury or death and / or the possibility of damage.

CE CONFORMITY

The declaration is made by us. You can send an email to support@adfweb.com or give us a call if you need it.

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

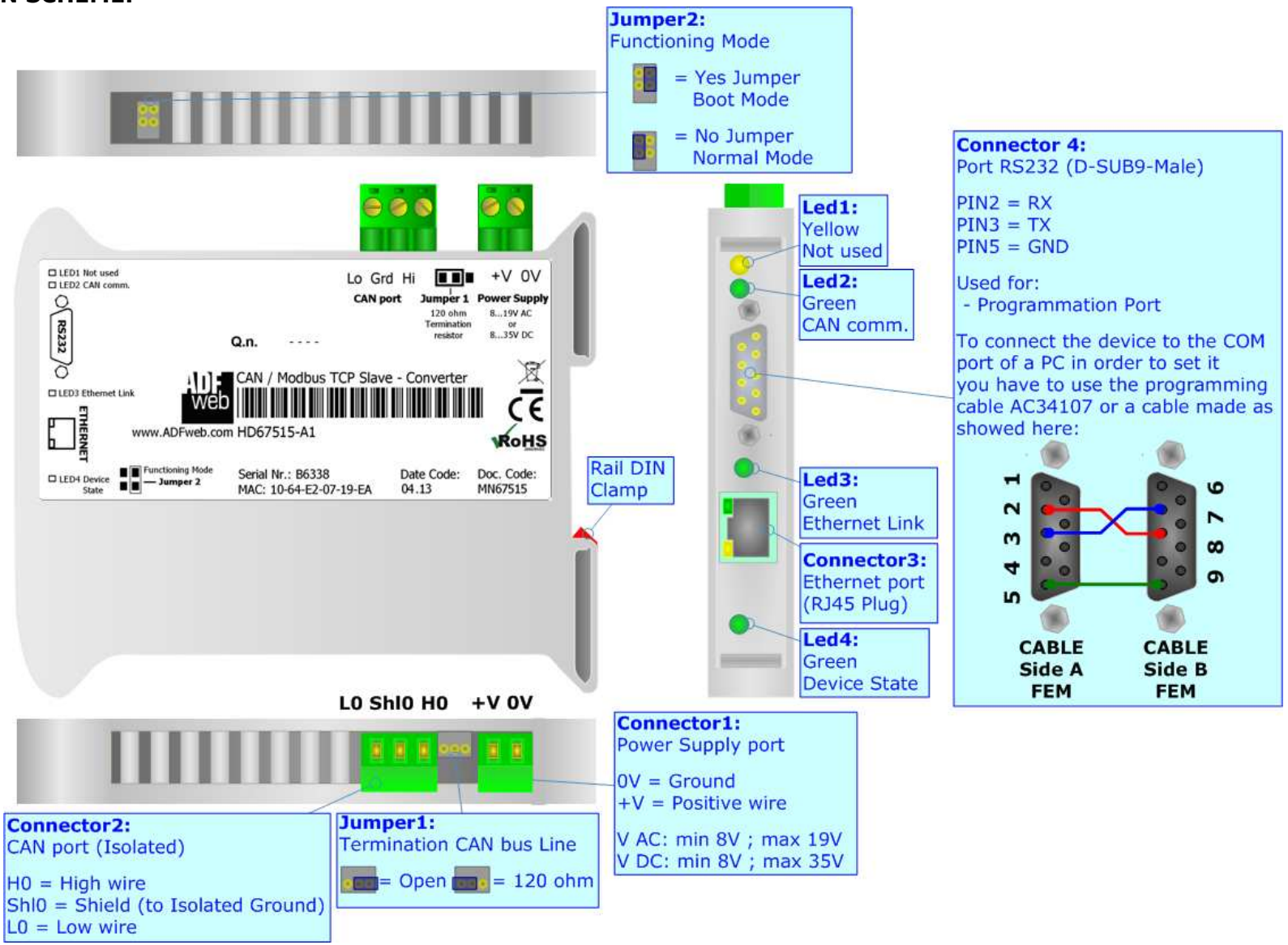


Figure 1: Connection scheme for HD67515-A1

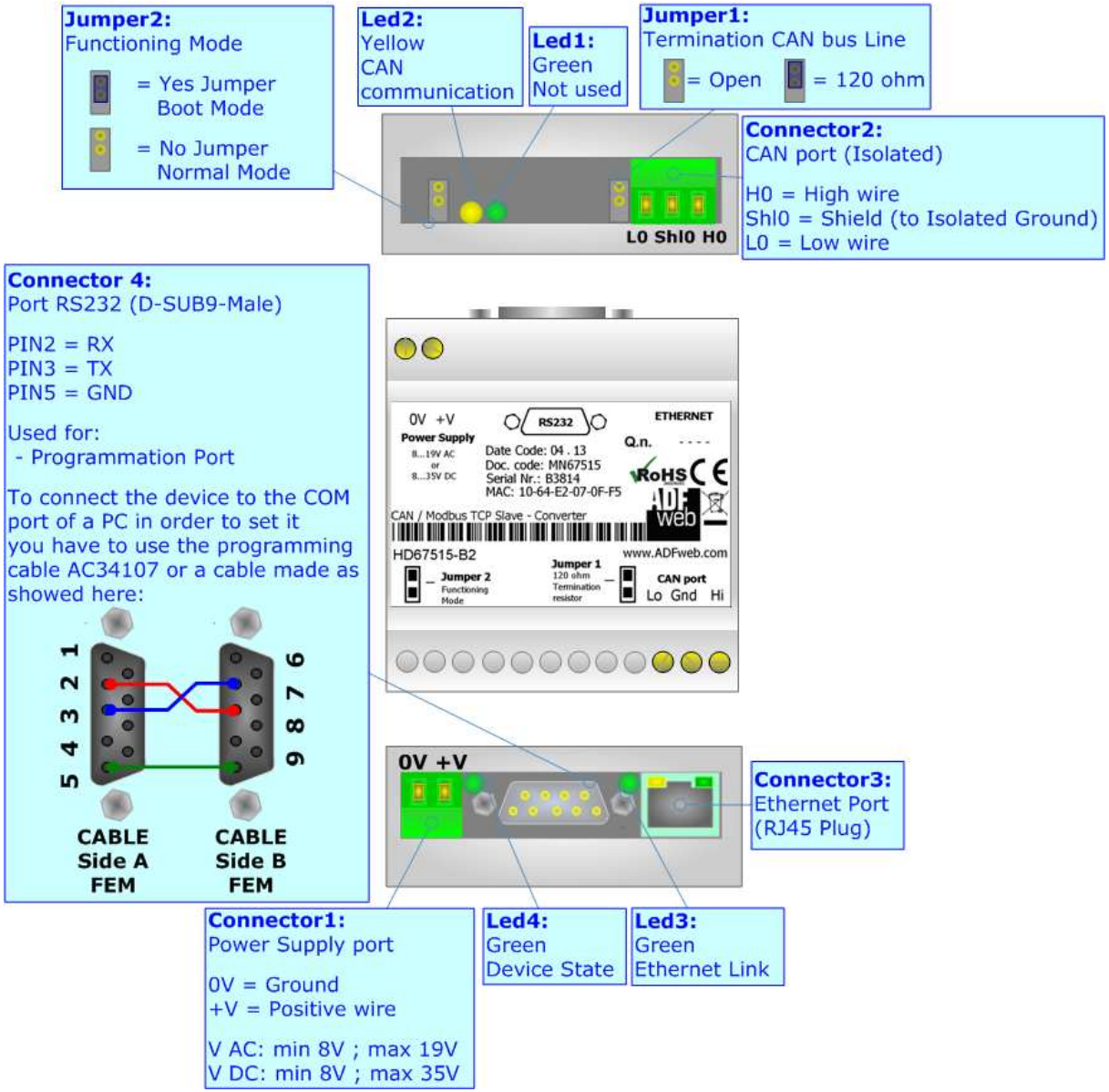


Figure 2: Connection scheme for HD67515-B2

CHARACTERISTICS:

The "CAN / Modbus TCP Slave – Converter" allows the following characteristics:

- two-directional information between networks CAN and Modbus;
- electrical isolation between two Buses;
- to read CAN frame from Modbus word;
- to write CAN frame from Modbus word;
- Mountable on Rail DIN;
- Temperature range from -40°C to +85°C.

This device is able to manage a maximum of four simultaneous connections at Modbus TCP side.

CONFIGURATION:

You need Compositor SW67515 software on your PC in order to perform the following:

- Define the parameter of CAN;
- Define the parameter of Modbus TCP;
- Define which CAN frames are read by the Modbus;
- Define which CAN frames are write by the Modbus.

CHARACTERISTICS OF TERMINAL BLOCKS PLUGS:

Compatible Terminal Block 2 Wire (Phoenix Contact, order code) : MSTB 2,5 HC/ 2-ST
Compatible Terminal Block 3 Wire (Phoenix Contact, order code) : MSTB 2,5 HC/ 3-ST

POWER SUPPLY:

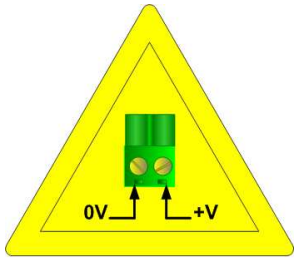
The devices can be powered at 8…19V AC and 8…35V DC. The consumption depends to the code of the device. For more details see the two tables below.

VAC ~		VDC ⎓	
Vmin	**Vmax**	**Vmin**	**Vmax**
8V	**19V**	**8V**	**35V**

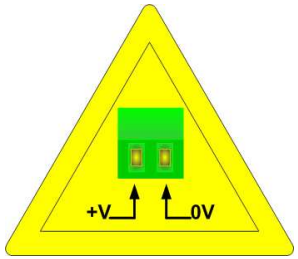
Consumption at 24V DC:

Device	Consumption [W/VA]
HD67515-A1	4
HD67515-B2	5

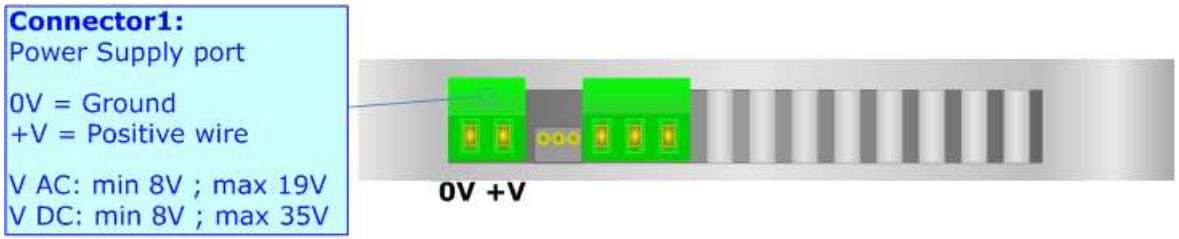
Caution: Not reverse the polarity power

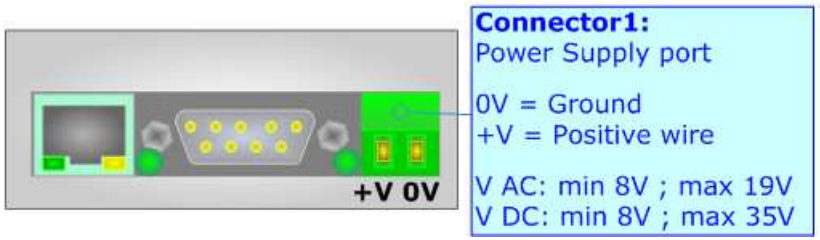


HD67515-A1



HD67515-B2





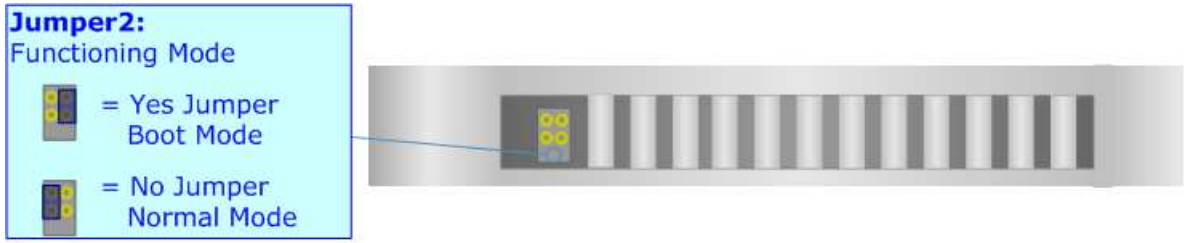
FUNCTION MODES:

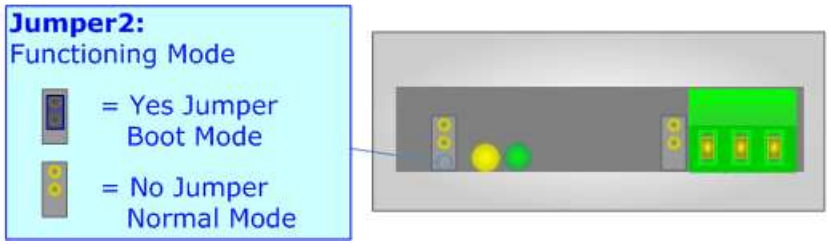
The device has got two functions mode depending of the position 'Jumper2':

- The first, without Jumper2 (factory setting), is used for the normal working of the device.
- The second, with Jumper2, is used for upload the Project/Firmware into the device.

For the operations to follow for the updating, see 'UPDATE DEVICE' section.

According to the functioning mode, the LEDs will have specifics functions, see 'LEDS' section.

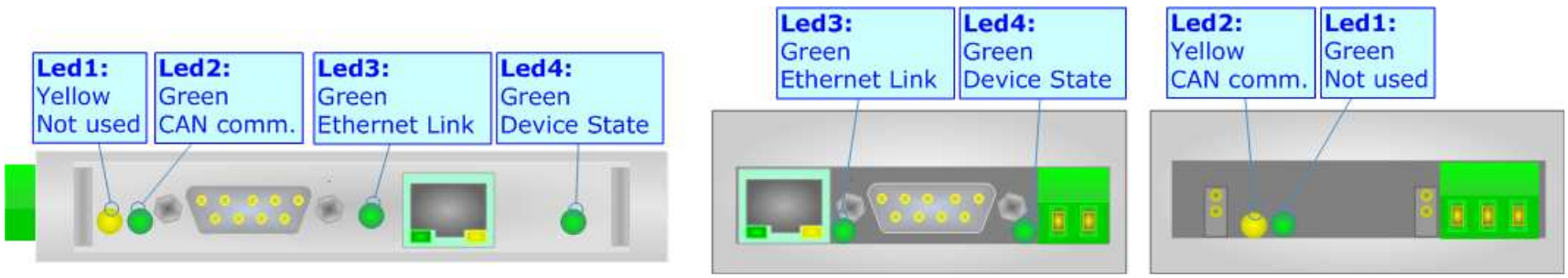




LEDS:

The device has got four LEDs that are used to give information of the functioning status.
The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Not used	OFF	OFF
2: CAN comm.	Change state when receive a CAN frame defined in the Compositor	OFF
3: Ethernet Link	**ON:** Ethernet cable connected **OFF:** Ethernet cable disconnected	**ON:** Ethernet cable connected **OFF:** Ethernet cable disconnected
4: Device State	Blinks slowly (~1Hz)	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress



ETHERNET:

The Ethernet connection must be made using Connector3 of HD67515-A1/HD67515-B2 with at least a Category 5E cable. The maximum length of the cable should not exceed 100m. The cable has to conform to the T568 norms relative to connections in cat.5 up to 100 Mbps. To connect the device to an Hub/Switch is recommended the use of a straight cable, to connect the device to a PC/PLC/other is recommended the use of a cross cable.

CAN:

For terminate the CAN line with a 120Ω resistor it is necessary that the 'Jumper1' is inserted.

Cable characteristics:

DC parameter:		Impedance	70 Ohm/m
AC parameters:		Impedance	120 Ohm/m
		Delay	5 ns/m

Length		**Baud Rate [bps]**	**Length MAX [m]**
		10 K	5000
		20 K	2500
		50 K	1000
		100 K	650
		125 K	500
		250 K	250
		500 K	100
		800 K	50
		1000 K	25

RS232:

The connection from RS232 socket to a serial port (example one from a personal computer), must be made with a Null Modem cable (a serial cable where the pins 2 and 3 are crossed). It is recommended that the RS232C Cable not exceed 15 meters.
The serial port is used for programming the device.

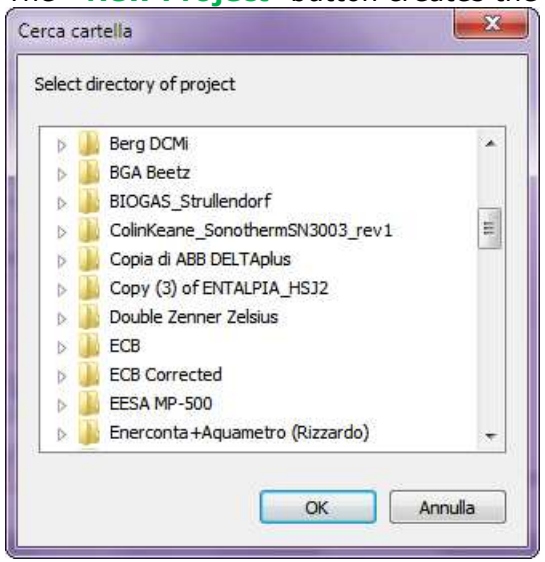
USE OF COMPOSITOR SW67515:

To configure the "CAN / Modbus TCP Slave - Converter", use the available software that runs with Windows, called SW67515. It is downloadable on the site www.adfweb.com and its operation is described in this document. *(This manual is referenced to the last version of the software present on our web site)*. The software works with MSWindows (MS 2000, XP, Vista, Seven, 8; 32/64bit).
When launching the SW67515 the right window appears (Fig. 3).

Figure 3: Main window for SW67515

NEW PROJECT / OPEN PROJECT:

The "**New Project**" button creates the folder which contains the entire device configuration.



A device configuration can also be imported or exported:

- To clone the configurations of a Programmable "CAN / Modbus TCP Slave - Converter" in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button "**Open Project**".

SET COMMUNICATION:

This section defines the fundamental communication parameters of two Buses, CAN and Modbus.

By pressing the "**Set Communication**" button from the main window for SW67515 (Fig. 3) the window "Set communication" appears (Fig. 4).

This window is divided in two sections, one for configure the CAN Network and the other for the Modbus.

The means for the fields for the "CAN Bus" are:

- In the field "**Baud Rate**" the velocity of the CAN is defined;
- If the field "**CAN Bus 2.0A**" is checked, the CAN with a CobID of 11Bit is used; otherwise if the field "**CAN Bus 2.0B**" is checked the CAN with a CobID of 29Bit is used;
- "**TimeOut**" is the timeout of the data. If this time is elapsed the value of the data of the CAN frame become "0". If the "TimeOut" field is checked in the "Receive CAN Frame" window (See Fig. 5).

The means for the fields for Modbus TCP are:

- In the field "**IP Address**", insert the IP address that you want to give to slave Modbus;
- In the field "**SubNet Mask**" insert the SubNet Mask;
- In the field "**Port**" insert the number of the port;
- In the field "**Default Gateway**", insert the IP of the defualt gateway that you want to use;
- If the field "**Fast StartUp**" is checked, the gateway take less time to go online. This command can use only if the gateway is used in a 100Mb/s network.

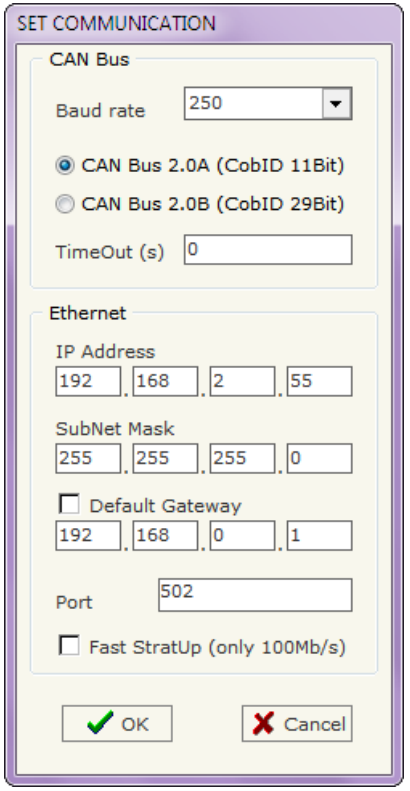


Figure 4: "Set communication" window

PING DEVICE:

If it is necessary to do a Ping on the net, before pressing the "Ping Device" button insert a value in the field on the right and then press the button. In order to do this, the gateway must be in RUN mode. To use this feature in Vista and 7 you have to open the software with Administrator right.

RECEIVE COB:

By pressing the "**Receive COB**" button from the main window for SW67515 (Fig. 3) the window "Receive CAN Frame" appears (Fig. 5).

A user who has to read a CAN frame from CAN to Modbus needs to insert the coordinates of the CAN frame to be transmitted in the field "Receive COB" of the window:

- In the field "**CobID**" insert the Cob_ID of the CAN frame;
- In the field "**Dimension**" insert the number of bytes of the CAN frame (the maximum dimension is 8 Bytes);
- If the field "**TimeOut**" is checked, after the timeout defined
  - in the "Set Communication" window the value of the data
  - of the CAN frame become "0";
- In the field "**Mnemonic**" a description of the frame is defined.

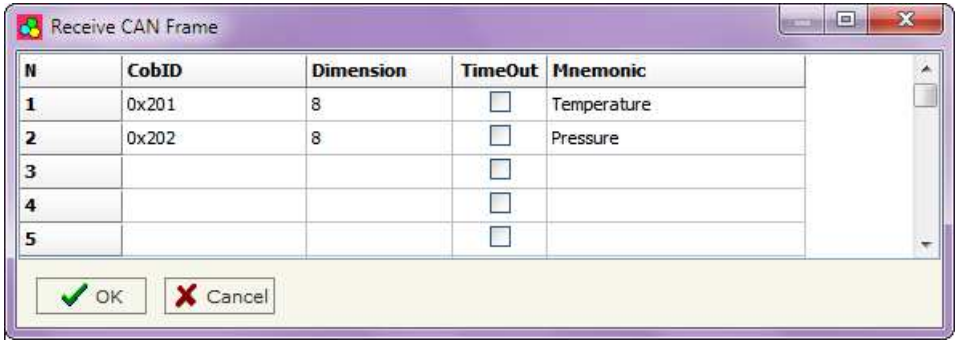


Figure 5: "Receive CAN Frame" window

DEFINE COB:

By pressing the "**Define COB**" button from the main window for SW67515 (Fig. 3) the window "Receive CAN Frame Info" appears (Fig. 6).

- In the field "**COB-ID** Frame" there are the COB-ID that you insert in the list "Receive CAN Frame";
- In the field "**MODBUS**" there are the Modbus registers create for this CAN Frame;
- In the field "**Index MODBUS**" there is the address that contains the CAN bytes;
- In the field "**Selecet Frame Byte**" you select the position of the byte.

For example:

Click on the "COB-ID Frame", insert the valid address in the field "Index MODBUS", select the byte position (B1 in "High MODBUS Byte" and B2 in "Low MODBUS Byte"), click the "New" button, then in the field "MODBUS" appears the names of Modbus words (The fisrt word is name IND MB 0, the second IND MB 1, the third Ind MB 2, and so on).

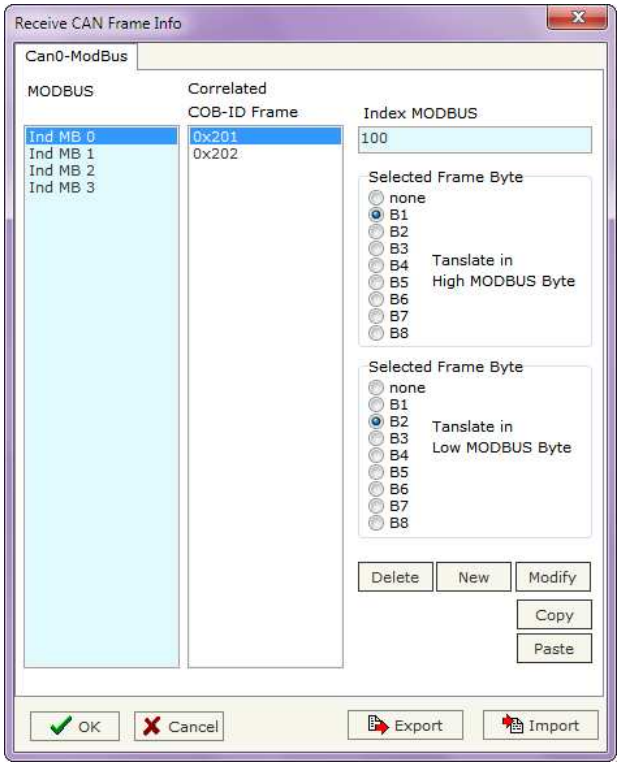


Figure 6: "Receive CAN Frame Info" window

TRASMIT COB:

By pressing the "**Transmit COB**" button from the main window for SW67515 (Fig. 3) the window "Transmit CAN Frame" appears (Fig. 7).

A user who has to write a CAN frame from Modbus to CAN needs to insert the coordinates of the CAN frame to be transmitted in the field "Trasmit COB" of the window:

- In the field "**CobID**" insert the Cob_ID of the CAN frame;
- In the field "**Dimension**" insert the number of bytes of the CAN frame (the maximum dimension is 8 Bytes);
- In the field "**Mnemonic**" a description of the frame is defined.

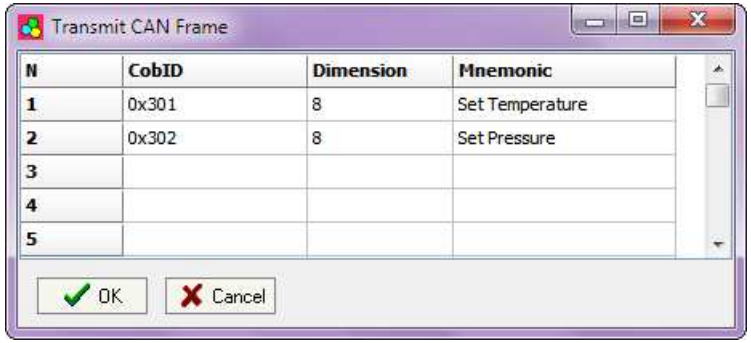


Figure 7: "Transmit CAN Frame" window

DEFINE COB:

By pressing the "**Define COB**" button from the main window for SW67515 (Fig. 3) the window "Transmit CAN Frame Info" appears (Fig. 8).

- In the field "**COB-ID Frame**" there are the COB-ID that you insert in the list "Transmit CAN Frame";
- In the field "**MODBUS**" there are the Modbus registers create for this CAN Frame;
- In the field "**Index MODBUS**" there is the address who contain the CAN Bytes.
- In the field "**Selecet Frame Byte**" you select the position of the byte.

For example:

Click on the "COB-ID Frame", insert the valid address in the field "Index MODBUS", select the byte position (B1 in "High MODBUS Byte" and B2 in "Low MODBUS Byte"), click the "New" button, then in the field "MODBUS" appears the names of Modbus words (The first word is name IND MB 0, the second IND MB 1, the third Ind MB 2, and so on).

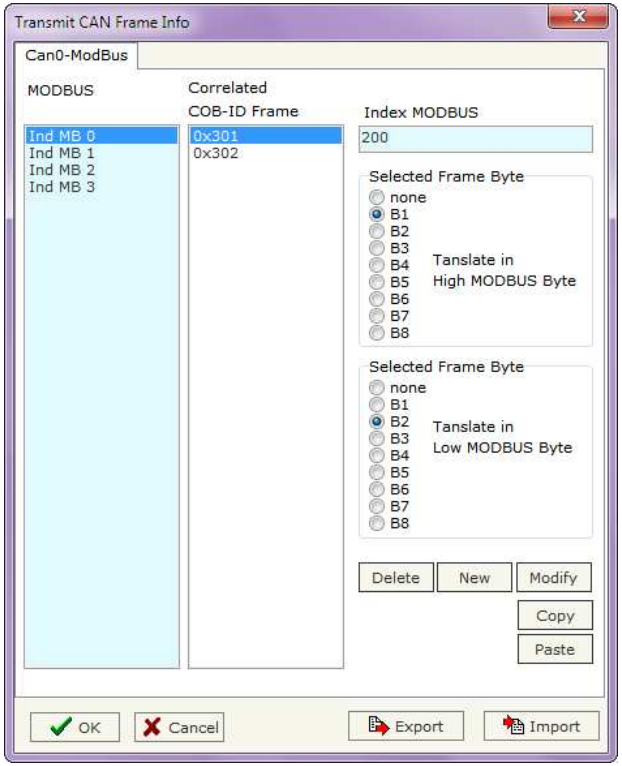


Figure 8: "Transmit CAN Frame Info" window

UPDATE DEVICE:

By pressing the "**Update Device**" button it is possible to load the created Configuration into the device; and also the Firmware, if is necessary.

In order to load the parameters or update the firmware in the device, follow these instructions:

- Turn off the Device;
- Connect the RS232 Null Modem Cable form your PC to the Converter;
- Insert the Boot Jumper (see "FUNCTION MODES" section);
- Select the "**COM port**" and press the "**Connect**" button;
- Turn on the device;
- Check the BOOT Led. It must blink quickly (see "LEDS" section);
- Press the "**Next**" button;
- Select which operations you want to do.
- Press the "**Execute update firmware**" button to start the upload;
- When all the operations are "OK" turn off the device;
- Remove the Boot jumper;
- Disconnect the RS232 Cable;
- Turn on the device.

At this point the configuration/firmware on the device is correctly updated.

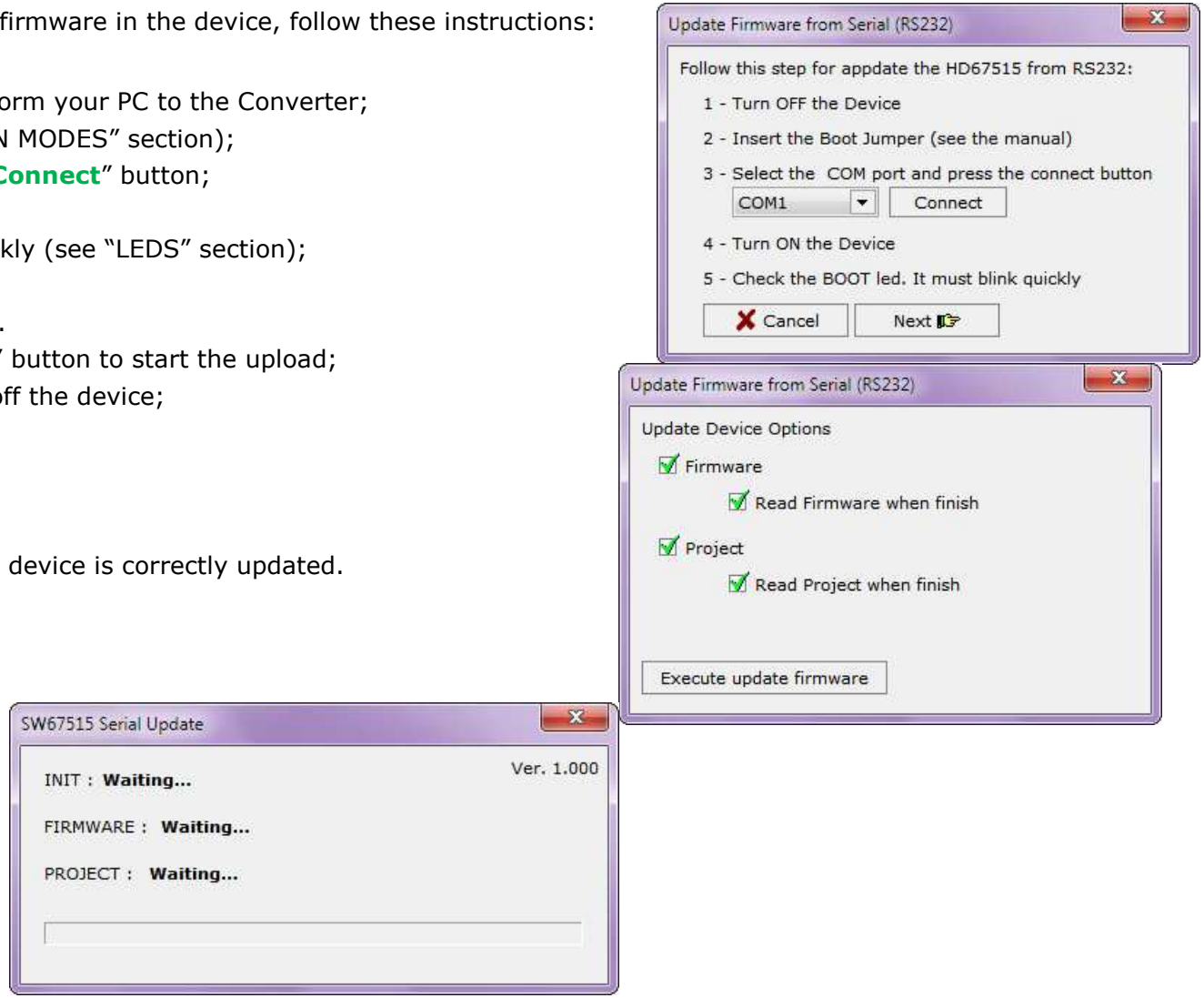

Update Firmware from Serial (RS232)
Follow this step for appdate the HD67515 from RS232:
1 - Turn OFF the Device
2 - Insert the Boot Jumper (see the manual)
3 - Select the COM port and press the connect button
COM1
Connect
4 - Turn ON the Device
5 - Check the BOOT led. It must blink quickly
Cancel
Next
Update Firmware from Serial (RS232)
Update Device Options
Firmware
Read Firmware when finish
Project
Read Project when finish
Execute update firmware
SW67515 Serial Update
Ver. 1.000
INIT : Waiting...
FIRMWARE : Waiting...
PROJECT : Waiting...

Figure 9: "Update Device" windows

Note:

When you install a new version of the software it is better if the first time you do the update of the Firmware in the HD67515-A1 or HD67515-B2 device.

Note:

When you receive the device, for the first time, you have to update also the Firmware in the HD67515-A1 or HD67515-B2 device.

Warning:

If the Fig. 10 appears when you try to do the Update before require assistance try these points:

- Check if the serial COM port selected is the correct one;
- Check if the serial cable is connected between the PC and the device;
- Try to repeat the operations for the updating;
- If you are using a USB←→RS232 converter try with a native COM port or change the converter;
- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven or Vista, make sure that you have the administrator privileges;
- Take attention at Firewall lock.

Figure 10: "Protection" window

In the case of HD67505-A1 or HD67505-B2 you have to use the software "SW67515": www.adfweb.com\download\filefold\SW67515.zip.

MECHANICAL DIMENSIONS:

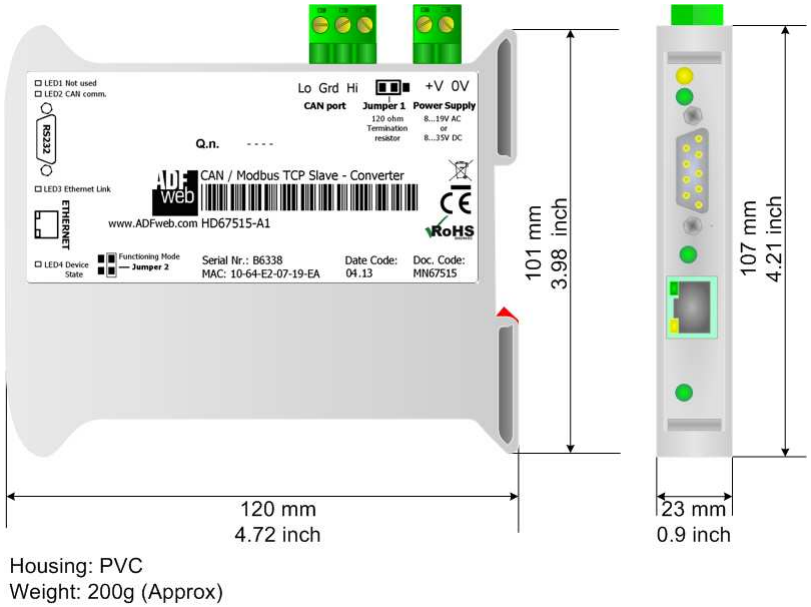


Figure 11: Mechanical dimensions scheme for HD67515-A1

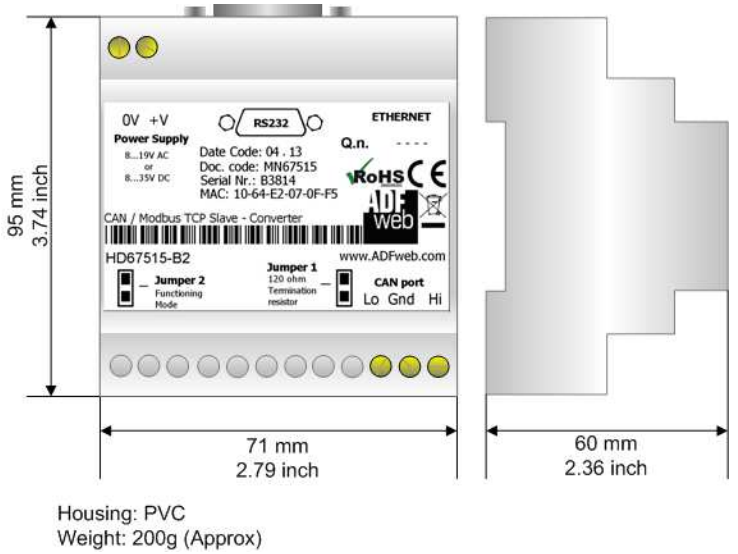


Figure 12: Mechanical dimensions scheme for HD67515-B2

ORDER CODE:

Order Code: **HD67515-A1** - CAN / Modbus TCP Slave – Converter (Housing type: A, Terminal Blocks Connectors)

Order Code: **HD67515-B2** - CAN / Modbus TCP Slave – Converter (Housing type: B, Terminal Blocks Connectors)

ACCESSORIES:

Order Code: **AC34107** - Null Modem Cable Fem/Fem DSub 9 Pin 1,5 m

Order Code: **AC34114** - Null Modem Cable Fem/Fem DSub 9 Pin 5 m

Order Code: **AC34001** - Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V AC

Order Code: **AC34002** - Rail DIN - Power Supply 110V AC 50/60Hz – 12 V AC

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OTHER REGULATIONS AND STANDARDS

WEEE INFORMATION

Disposal of old electrical and electronic equipment (as in the European Union and other European countries with separate collection systems).
This symbol on the product or on its packaging indicates that this product may not be treated as household rubbish. Instead, it should be taken to an applicable collection point for the recycling of electrical and electronic equipment. If the product is disposed correctly, you will help prevent potential negative environmental factors and human health, which could otherwise be caused by inappropriate disposal. The recycling of materials will help to conserve natural resources. For more information about recycling this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

RESTRICTION OF HAZARDOUS SUBSTANCES DIRECTIVE

The device respects the 2002/95/EC Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (commonly referred to as Restriction of Hazardous Substances Directive or RoHS).

CE MARKING

The product conforms with the essential requirements of the applicable EC directives.

WARRANTIES AND TECHNICAL SUPPORT:

For fast and easy technical support for your ADFweb.com SRL products, consult our internet support at www.adfweb.com.
Otherwise contact us at the address support@adfweb.com

RETURN POLICY:

If while using your product you have any problem and you wish to exchange or repair it, please do the following:

1) Obtain a Product Return Number (PRN) from our internet support at www.adfweb.com. Together with the request, you need to provide detailed information about the problem.
2) Send the product to the address provided with the PRN, having prepaid the shipping costs (shipment costs billed to us will not be accepted).

If the product is within the warranty of twelve months, it will be repaired or exchanged and returned within three weeks. If the product is no longer under warranty, you will receive a repair estimate.

PRODUCTS AND RELATED DOCUMENTS:

Part	Description	URL
HD67181	CAN - Repeater - Extender bus line	www.adfweb.com?Product=HD67181
HD67316	CAN Analyzer Hardware and Software	www.adfweb.com?Product=HD67216